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Formulation of medicated nanoparticles based on branched PLGA

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Poly(lactic-*co*-glycolic acid) (PLGA) is currently the most widely used biomaterial for encapsulation and prolonged delivery of therapeutic drugs, proteins and antigens [1]. We introduce originally synthesized branched PLGA derivatives with lower molar mass, and star or comb architecture as promising biodegradable carriers for prolonged or targeted drug release systems [2]. These polyesters were used as starting materials for nanoparticles formulation by nanoprecipitation, and double-emulsion method. We successfully incorporated various molecules such as Terbinafine, Rifampicin, and Small interfering RNA (siRNA). Multiple parameters as particles size, polydispersity, zeta potential, encapsulation efficiency, and loading capacity were monitored. Morphology of the nanoparticles was studied by scanning electron microscope (SEM). The use of the polymers with tailored properties resulted in formulation of the nanoparticles with desired particle size, mucoadhesive properties, and prolonged drug release profile which we attribute to the gradual swelling and degradation of the polyester in an aqueous medium [3]. The hydrophobicity and the polyester concentration revealed the main impact on the nanoparticles size ranging from 100 to 600nm [4]. Examined polyesters are perspective, original, and suitable for further observation.

References

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